Appl. No.: 09/672,049

April 19, 2004

Reply to Office Action of November 19, 2003

Page 2

This listing of claims will replace all prior versions, and listings, of claims in the application:

**LISTING OF CLAIMS:** 

1. (Previously Presented) A galenical formulation comprising paramagnetic

perfluoroalkyl and diamagnetic perfluoroalkyl- compounds.

2. (Previously Presented) A formulation according to claim 1, wherein the ratio of the

paramagnetic perfluoroalkyl compound to the diamagnetic perfluoroalkyl-compound is from

5:95 to 95:5.

3. (Previously Presented) A formulation according to claim 1, wherein the

paramagnetic perfluoroalkyl and diamagnetic perfluoroalkyl- compounds are present

dissolved in an aqueous solvent.

4. (Previously Presented) A formulation according to claim 1, wherein the

paramagnetic perfluoroalkyl-containing compounds are those of general formula I:

RF-A

Ι

in which R<sup>F</sup> represents a straight-chain or branched perfluoroalkyl radical with 4 to 30

carbon atoms, and A is a molecule portion that contains 1-6 metal complexes.

- 5. (Previously Presented) A formulation according to claim 4, wherein molecule portion A stands for a group L-M, wherein L stands for a linker and M stands for a metal complex that comprises an open-chain or cyclic chelating agent having a central atom of atomic number 21-29, 39, 42, 44 or 57-83.
- 6. (Withdrawn) A formulation according to claim 5, wherein linker L is a direct bond, a methylene group, an -NHCO group, a group

$$- \left[ (CH_2)_{\overline{u}} - NHCOCH_2 - (CH_2)_{\overline{p}} \right]_{\overline{q}}^{R^1} N - SO_2 - \cdots$$

whereby p means the numbers 0 to 10, q and u,

independently of one another, mean the numbers 0 or 1, and

means a hydrogen atom, a methyl group, a -CH<sub>2</sub>-OH group, a -CH<sub>z</sub>-CO<sub>2</sub>H group or a  $C_2$ - $C_{15}$  chain, which optionally is interrupted by 1 to 3 oxygen atoms, 1 to 2 > CO groups or an optionally substituted aryl group and/or is substituted with 1 to 4 hydroxyl groups, 1 to 2  $C_1$ - $C_4$  alkoxy groups, 1 to 2 carboxy groups,

or a straight-chain, branched, saturated or unsaturated C<sub>2</sub>-C<sub>30</sub> carbon chain, which optionally contains 1 to 10 oxygen atoms, 1 to 3 -NR<sup>1</sup> groups, 1 to 2 sulfur atoms, a piperazine, a -CONR<sup>1</sup> group, an -NR<sup>1</sup>CO group, an -SO<sub>2</sub> group, an -NR<sup>1</sup>-CO<sub>2</sub> group, 1 to 2 CO groups, a group

$$-CO-N-T-N(R^1)-SO_2-R^F \qquad \text{or 1 to 2}$$

optionally substituted aryls and/or is interrupted by these groups and/or is optionally substituted with 1 to 3 -OR<sup>1</sup> groups, 1 to 2 oxo groups, 1 to 2 -NH-COR<sup>1</sup> groups, 1 to 2 -CONHR<sup>1</sup> groups, 1 to 2 (-CH<sub>2</sub>)<sub>p</sub>-CO<sub>2</sub>H groups, 1 to 2 groups -(CH<sub>2</sub>)<sub>p</sub>-(O)<sub>q</sub>-CH<sub>2</sub>CH<sub>2</sub>-R<sup>F</sup>,

whereby

R<sup>1</sup>, and p and q have the above-indicated meanings,

and R<sup>1</sup> represents a straight-chain or branched perfluoroalkyl radical with 4 to 30 carbon atoms

T means a  $C_2$ - $C_{10}$  chain, which optionally is interrupted by 1 to 2 oxygen atoms or 1 to 2 -NHCO groups.

7. (Withdrawn) A formulation according to claim 5, wherein metal complex M stands for a complex of general formula II

$$O = C \qquad \qquad CH_2CH_2 \qquad \qquad W$$

$$CO_2Z^1 \qquad \qquad CO_2Z^1$$

$$O = C \qquad \qquad N$$

$$OZ^1 \qquad \qquad COY \qquad (II)$$

in which R3, Z1 and Y are independent of one another, and

 $R^3$  has the meaning of  $R^1$  or  $-(CH_2)_m$ -L- $R^F$ , whereby m is 0, 1 or 2, and L is a direct bond, a methylene group, an -NHCO group, a group

 $R^1$ 

Reply to Office Action of November 19, 2003

$$- \underbrace{ \left\{ (\operatorname{CH}_2)_{\operatorname{u}} - \operatorname{NHCOCH}_2 - (\operatorname{CH}_2)_{\operatorname{p}} \right\}_{\operatorname{q}}^{\operatorname{R}^1}}_{\operatorname{q}} \operatorname{N-SO}_2 - \cdots$$

whereby p means the numbers 0 to 10, q and u, independently of one another, mean the numbers 0 or 1, and

means a hydrogen atom, a methyl group, a -CH<sub>2</sub>-OH group, a -CH<sub>2</sub>CO<sub>2</sub>H group or a  $C_2$ - $C_{15}$  chain, which optionally is interrupted by 1 to 3 oxygen atoms, 1 to 2 > CO groups or an optionally substituted aryl group and/or is substituted with 1 to 4 hydroxyl groups, 1 to 2  $C_1$ - $C_4$  alkoxy groups, 1 to 2 carboxy groups,

or a straight-chain, branched, saturated or unsaturated  $C_2$ - $C_{30}$  carbon chain, which optionally contains 1 to 10 oxygen atoms, 1 to 3 -NR<sup>1</sup> groups, 1 to 2 sulfur atoms, a piperazine, a -CONR<sup>1</sup> group, an -NR<sup>1</sup>CO group, an -SO<sub>2</sub> group, an -NR<sup>1</sup>-CO<sub>2</sub> group, 1 to 2 CO groups, a group

$$-CO-N-T-N(R^1)-SO_2-R^F$$
 or 1 to 2

optionally substituted aryls and/or is interrupted by these groups and/or is optionally substituted with 1 to 3  $-OR^1$  groups, 1 to 2 oxo groups, 1 to 2  $-NH^1$  groups, 1 to 2  $-CONHR^1$  groups, 1 to 2- $-CONHR^1$  groups, 1 t

whereby

R<sup>1</sup>, and p and q have the above-indicated meanings, and R<sup>F</sup> represents a straight-chain or branched perfluoroalkyl radical with 4 to 30 carbon atoms, and A is a molecule portion that contains 1-6 metal complexes,

Reply to Office Action of November 19, 2003

Page 6

Z<sup>1</sup>, independently of one another, mean a hydrogen atom or a metal ion equivalent of atomic numbers 21-29, 39, 42, 44 or 57-83,

Y means -OZ<sup>1</sup> or

$$-N$$
 $R^3$ 
or
 $-N$ 
 $N-SO_2-L-R^5$ 

whereby Z<sup>1</sup> and R<sup>3</sup> have the above-mentioned meanings.

8. (Withdrawn) A formulation according to claim 5, wherein metal complex M stands for a complex of general formula III

in which

R<sup>3</sup> and Z<sup>1</sup> are independent of one another, and

 $R^3$  has the meaning of  $R^1$  or  $-(CH_2)_m$ -L- $R^1$ , whereby m is 0, 1 or 2, and L is a direct bond, a methylene group, an -NHCO group, a group

$$- \left[ (CH_2)_{\overline{u}} - NHCOCH_2 - (CH_2)_{\overline{p}} \right]_{\overline{q}}^{R^1} N - SO_2 - \cdots$$

 $R^1$ 

whereby p means the numbers 0 to 10, q and u, independently of one another, mean the numbers 0 or 1, and

means a hydrogen atom, a methyl group, a -CH<sub>2</sub>-OH group, a -CH<sub>2</sub>-CO<sub>2</sub>H group or a  $C_2$ - $C_{15}$  chain, which optionally is interrupted by 1 to 3 oxygen atoms, 1 to 2 > CO groups or an optionally substituted aryl group and/or is substituted with 1 to 4 hydroxyl groups, 1 to 2  $C_1$ - $C_4$  alkoxy groups, 1 to 2 carboxy groups,

or a straight-chain, branched, saturated or unsaturated C<sub>2</sub>-C<sub>30</sub> carbon chain, which optionally contains 1 to 10 oxygen atoms, 1 to 3 -NR<sup>1</sup> groups, 1 to 2 sulfur atoms, a piperazine, a -CONR<sup>1</sup> group, an -NR<sup>1</sup>CO group, an -SO<sub>2</sub> group, an -NR<sup>1</sup>-CO<sub>2</sub> group, 1 to 2 CO groups, a group

$$-CO-N-T-N(R^1)-SO_2-R^F \qquad \text{or 1 to 2}$$

optionally substituted aryls and/or is interrupted by these groups and/or is optionally substituted with 1 to 3 -OR<sup>1</sup> groups, 1 to 2 oxo groups, 1 to 2 -NH-COR<sup>1</sup> groups, 1 to 2 -CONHR<sup>1</sup> groups, 1 to 2 (-CH<sub>2</sub>)<sub>p</sub>-CO<sub>2</sub>H groups, 1 to 2 groups -(CH<sub>2</sub>)<sub>p</sub>-(O)<sub>q</sub>-CH<sub>2</sub>CH<sub>2</sub>-R<sup>F</sup>,

whereby

R1, and p and q have the above-indicated meanings,

and R<sup>F</sup> represents a straight-chain or branched perfluoroalkyl radical with 4 to 30 carbon atoms, and A is a molecule portion that contains 1-6 metal complexes,

Z<sup>1</sup>, independently of one another, mean a hydrogen atom or a metal ion equivalent of atomic numbers 21-29, 39, 42, 44 or 57-83,

Reply to Office Action of November 19, 2003

and R<sup>2</sup>

means a hydrogen atom, a methyl group, a  $-CH_2$ -OH group, a  $-CH_2$ -CO<sub>2</sub>H group or a  $C_2$ - $C_{15}$  chain, which optionally is interrupted by 1 to 3 oxygen atoms, 1 to 2 > CO groups or an optionally substituted aryl group and/or is substituted with 1 to 4 hydroxyl groups, 1 to 2  $C_1$ - $C_4$  alkoxy groups, 1 to 2 carboxy groups,

or a straight-chain, branched, saturated or unsaturated  $C_2$ - $C_{30}$  carbon chain, which optionally contains 1 to 10 oxygen atoms, 1 to 3 -NR<sup>1</sup> groups, 1 to 2 sulfur atoms, a piperazine, a -CONR<sup>1</sup> group, an -NR<sup>1</sup>CO group, an -SO<sub>2</sub> group, an -NR<sup>1</sup>-CO<sub>2</sub> group, 1 to 2 CO groups, a group

$$-CO-N-T-N(R^1)-SO_2-R^F or 1 to 2$$

optionally substituted aryls and/or is interrupted by these groups and/or is optionally substituted with 1 to 3 -OR $^1$  groups, 1 to 2 oxo groups, 1 to 2 -NH-COR $^1$  groups, 1 to 2 -CONHR $^1$  groups, 1 to 2 (-CH $_2$ ) $_p$ -CO $_2$ H groups, 1 to 2 groups -(CH $_2$ ) $_p$  (O) $_q$ -CH $_2$ CH $_2$ -R $^F$ .

9. (Withdrawn) A formulation according to claim 5, wherein metal complex M stands for a metal complex of general formula IV

$$Z^{1}O_{2}C$$
 $CO_{2}Z^{1}$ 
 $CO_{2}Z^{1}$ 
 $CO_{2}Z^{1}$ 
 $CO_{2}Z^{1}$ 
 $CO_{2}Z^{1}$ 
 $CO_{2}Z^{1}$ 
 $CO_{2}Z^{1}$ 
 $CO_{2}Z^{1}$ 
 $CO_{2}Z^{1}$ 
 $CO_{2}Z^{1}$ 

in which Z<sup>1</sup>

independently of one another, mean a hydrogen atom or a metal ion equivalent of atomic numbers 21-29, 39, 42, 44 or 57-83.

10. (Withdrawn) A formulation according to claim 5, wherein metal complex M stands for a metal complex of general formula V

$$Z^{1}O_{2}C \longrightarrow N$$

$$CO_{2}Z^{1}$$

in which Z1

independently of one another, mean a hydrogen atom or a metal ion equivalent of atomic numbers 21-29, 39, 42, 44 or 57-83,

and o and q stand for numbers 0 or 1, and yields the sum o + q = 1.

11. (Withdrawn) A formulation according to claim 5, wherein metal complex M stands for a metal complex of general formula VI

Reply to Office Action of November 19, 2003

$$Z^{1}O_{2}C$$
 $N$ 
 $N$ 
 $N$ 
 $N$ 
 $CO_{2}Z^{1}$ 
 $CO_{2}Z^{1}$ 

in which Z<sup>1</sup>

independently of one another, mean a hydrogen atom or a metal ion equivalent of atomic numbers 21-29, 39, 42, 44 or 57-83.

12. (Withdrawn) A formulation according to claim 5, wherein metal complex M stands for a metal complex of general formula VII

$$z^{1}O_{2}C$$
 $CO_{2}Z^{1}$ 
 $CO_{2}Z^{1}$ 

in which  $Z^1$  independently of one another, mean a hydrogen atom or a metal ion equivalent of atomic numbers 21-29, 39, 42, 44 or 57-83,

and Y means -OZ1 or

$$-N$$
 $R^3$ 
or
 $-N$ 
 $N-SO_2-L-R^F$ 

13. (Withdrawn) A formulation according to claim 5, wherein metal complex M is a complex of general formula VIII

in which

 $R^3$ 

has the meaning of  $R^1$  or  $-(CH_2)_m$ -L- $R^1$ , whereby m is 0, 1 or 2, and L is a direct bond, a methylene group, an -NHCO group, a group

$$-CO-N-T-N(R^1)-SO_2-R^F$$
 or 1 to 2

whereby p means the numbers 0 to 10, q and u,

independently of one another, mean the numbers 0 or 1, and

 $R^1$ 

means a hydrogen atom, a methyl group, a  $-CH_2$ -OH group, a  $-CH_2$ -CO<sub>2</sub>H group or a  $C_2$ - $C_{15}$  chain, which optionally is interrupted by 1 to 3 oxygen atoms, 1 to 2 > CO groups or an optionally substituted aryl group and/or is substituted with 1 to 4 hydroxyl groups, 1 to 2  $C_1$ - $C_4$  alkoxy groups, 1 to 2 carboxy groups,

or a straight-chain, branched, saturated or unsaturated  $C_2$ - $C_{30}$  carbon chain, which optionally contains 1 to 10 oxygen atoms, 1 to 3 -NR<sup>1</sup> groups, 1 to 2 sulfur atoms, a piperazine, a -CONR<sup>1</sup> group, an -NR<sup>1</sup>CO group, an -SO<sub>2</sub> group, an -NR<sup>1</sup>-CO<sub>2</sub> group, 1 to 2 CO groups, a group

Appl. No.: 09/672,049

April 19, 2004

Reply to Office Action of November 19, 2003

Page 12

$$-CO - N - T - N(R^1) - SO_2 - R^F$$
 or 1 to 2

optionally substituted aryls and/or is interrupted by these groups and/or is optionally substituted with 1 to 3 -OR $^1$  groups, 1 to 2 oxo groups, 1 to 2 -NH-COR $^1$  groups, 1 to 2 -CONHR $^1$  groups, 1 to 2 (-CH $_2$ ) $_p$ -CO $_2$ H groups, 1 to 2 groups -(CH $_2$ ) $_p$ -(O) $_q$ -CH $_2$ CH $_2$ -R $^F$ ,

whereby

R1, and p and q have the above-indicated meanings,

and R<sup>F</sup> represents a straight-chain or branched perfluoroalkyl radical with 4 to 30 carbon atoms, and A is a molecule portion that contains 1-6 metal complexes, and

Z<sup>1</sup>, independently of one another, mean a hydrogen atom or a metal ion equivalent of atomic numbers 21-29, 39, 42, 44 or 57-83,

and R2

means a hydrogen atom, a methyl group, a  $-CH_2$ -OH group, a  $-CH_2$ -CO<sub>2</sub>H group or a  $C_2$ - $C_{15}$  chain, which optionally is interrupted by 1 to 3 oxygen atoms, 1 to 2 > CO groups or an optionally substituted aryl group and/or is substituted with 1 to 4 hydroxyl groups, 1 to 2  $C_1$ - $C_4$  alkoxy groups, 1 to 2 carboxy groups,

or a straight-chain, branched, saturated or unsaturated C<sub>2</sub>-C<sub>30</sub> carbon chain, which optionally contains 1 to 10 oxygen atoms, 1 to 3 -NR<sup>1</sup> groups, 1 to 2 sulfur atoms, a piperazine, a -CONR<sup>1</sup> group, an -NR<sup>1</sup>CO group, an -SO<sub>2</sub> group, an -NR<sup>1</sup>-CO<sub>2</sub> group, 1 to 2 CO groups, a group

Reply to Office Action of November 19, 2003

Page 13

$$-CO-N-T-N(R^{1})-SO_{2}-R^{F}$$
 or 1 to 2

optionally substituted aryls and/or is interrupted by these groups and/or is optionally substituted with 1 to 3  $-OR^1$  groups, 1 to 2 oxo groups, 1 to 2  $-NH^1$  groups, 1 to 2  $-CONHR^1$  groups, 1 t

14. (Withdrawn) A formulation according to claim 5, wherein metal complex M is a complex of general formula IX

$$Z^1O_2C$$
 $CO_2Z^1$ 
 $OH$ 
 $CO_2Z^1$ 
 $R^3$ 
 $CO_2Z^1$ 
 $CO_2Z^1$ 

in which

R<sup>3</sup> has the meaning of R<sup>1</sup> or -(CH<sub>2</sub>)<sub>m</sub>-L-R<sup>F</sup>, whereby m is 0, 1 or 2, and L is a direct bond, a methylene group, an -NHCO group, a group

$$-CO-N-T-N(R^{1})-SO_{2}-R^{F}$$
 or 1 to 2

whereby p means the numbers 0 to 10, q and u,

independently of one another, mean the numbers 0 or 1, and

 $R^1$  means a hydrogen atom, a methyl group, a -CH<sub>2</sub>-OH group, a -CH<sub>2</sub>-CO<sub>2</sub>H group or a C<sub>2</sub>-C<sub>15</sub> chain, which optionally is interrupted by 1 to 3 oxygen atoms, 1 to 2 > CO groups or an optionally substituted aryl group and/or is

substituted with 1 to 4 hydroxyl groups, 1 to 2 C<sub>1</sub>-C<sub>4</sub> alkoxy groups, 1 to 2 carboxy groups,

or a straight-chain, branched, saturated or unsaturated C<sub>2</sub>-C<sub>30</sub> carbon chain, which optionally contains 1 to 10 oxygen atoms, 1 to 3 -NR<sup>1</sup> groups, 1 to 2 sulfur atoms, a piperazine, a -CONR<sup>1</sup> group, an -NR<sup>1</sup>CO group, an -SO<sub>2</sub> group, an -NR<sup>1</sup>-CO<sub>2</sub> group, 1 to 2 CO groups, a group

$$-CO-N-T-N(R^1)-SO_2-R^F$$
 or 1 to 2

optionally substituted aryls and/or is interrupted by these groups and/or is optionally substituted with 1 to 3  $\cdot$ OR<sup>1</sup> groups, 1 to 2 oxo groups, 1 to 2  $\cdot$ NH-COR<sup>1</sup> groups, 1 to 2  $\cdot$ CONHR<sup>1</sup> groups, 1 to 2 ( $\cdot$ CH<sub>2</sub>)<sub>p</sub>-CO<sub>2</sub>H groups, 1 to 2 groups  $\cdot$ (CH<sub>2</sub>)<sub>p</sub>-(O)<sub>q</sub>-CH<sub>2</sub>CH<sub>2</sub>-R<sup>1</sup>,

whereby

 $R^{1}$ , and p and q have the above-indicated meanings, and  $R^{F}$  represents a straight-chain or branched perfluoroalkyl radical with 4 to

30 carbon atoms, and A is a molecule portion that contains 1-6 metal

complexes, and

Z<sup>1</sup>, independently of one another, mean a hydrogen atom or a metal ion equivalent of atomic numbers 21-29, 39, 42, 44 or 57-83,

15. (Withdrawn) A formulation according to claim 5, wherein metal complex M is a complex of general formula X

$$Z^{1}O_{2}C$$
 $CO_{2}Z^{1}$ 
 $CO_{2}Z^{1}$ 

in which

 $\mathbb{R}^3$ 

has the meaning of  $R^1$  or  $-(CH_2)_m-L-R^1$ , whereby m is 0, 1 or 2, and L is a direct bond, a methylene group, an -NHCO group, a group

$$-CO-N-T-N(R^1)-SO_2-R^F$$
 or 1 to 2

whereby p means the numbers 0 to 10, q and u, independently of one another, mean the numbers 0 or 1, and

 $\mathbb{R}^1$ 

means a hydrogen atom, a methyl group, a -CH<sub>2</sub>-OH group, a -CH<sub>2</sub>-CO<sub>2</sub>H group or a  $C_2$ - $C_{15}$  chain, which optionally is interrupted by 1 to 3 oxygen atoms, 1 to 2 > CO groups or an optionally substituted aryl group and/or is substituted with 1 to 4 hydroxyl groups, 1 to 2  $C_1$ - $C_4$  alkoxy groups, 1 to 2 carboxy groups,

or a straight-chain, branched, saturated or unsaturated C<sub>2</sub>-C<sub>30</sub> carbon chain, which optionally contains 1 to 10 oxygen atoms, 1 to 3 -NR<sup>1</sup> groups, 1 to 2 sulfur atoms, a piperazine, a -CONR<sup>1</sup> group, an -NR<sup>1</sup>CO group, an -SO<sub>2</sub> group, an -NR<sup>1</sup>-CO<sub>2</sub> group, 1 to 2 CO groups, a group

$$-CO-N-T-N(R^1)-SO_2-R^F$$
 or 1 to 2

Reply to Office Action of November 19, 2003

optionally substituted aryls and/or is interrupted by these groups and/or is optionally substituted with 1 to 3 -OR $^1$  groups, 1 to 2 oxo groups, 1 to 2 -NH-COR $^1$  groups, 1 to 2 -CONHR $^1$  groups, 1 to 2 (-CH $_2$ ) $_p$ -CO $_2$ H groups, 1 to 2 groups -(CH $_2$ ) $_p$ -(O) $_q$ -CH $_2$ CH $_2$ -R $^F$ ,

whereby

R1, and p and q have the above-indicated meanings,

and R<sup>F</sup> represents a straight-chain or branched perfluoroalkyl radical with 4 to 30 carbon atoms, and A is a molecule portion that contains 1-6 metal complexes, and

- Z<sup>1</sup>, independently of one another, mean a hydrogen atom or a metal ion equivalent of atomic numbers 21-29, 39, 42, 44 or 57-83.
- 16. (Previously Presented) A formulation according to claim 5, wherein metal complex
  M is a complex of general formula XI

in which

Z<sup>1</sup>, independently of one another, mean a hydrogen atom or a metal ion equivalent of atomic numbers 21-29, 39, 42, 44 or 57-83,

and whereby p means the numbers 0 to 10, q and u,

independently of one another, mean the numbers 0 or 1, and

means a hydrogen atom, a methyl group, a -CH<sub>2</sub>-OH group, a -CH<sub>2</sub>-CO<sub>2</sub>H group or a C<sub>2</sub>-C<sub>15</sub> chain, which optionally is interrupted by 1 to 3 oxygen atoms, 1 to 2 -CO- groups or an optionally substituted aryl group and/or is substituted with 1 to 4 hydroxyl groups, 1 to 2 C<sub>1</sub>-C<sub>4</sub> alkoxy groups, 1 to 2 carboxy groups.

17. (Withdrawn) A formulation according to claim 5, wherein metal complex M is a complex of general formula XII

in which L is a direct bond, a methylene group, an -NHCO group, a group

$$-CO-N-T-N(R^1)-SO_2-R^F$$
 or 1 to 2

whereby p means the numbers 0 to 10, q and u,

independently of one another, mean the numbers 0 or 1, and

 $R^1$  means a hydrogen atom, a methyl group, a -CH<sub>2</sub>-OH group, a -CH<sub>2</sub>-CO<sub>2</sub>H group or a  $C_2$ - $C_{15}$  chain, which optionally is interrupted by 1 to 3 oxygen

atoms, 1 to 2 > CO groups or an optionally substituted aryl group and/or is substituted with 1 to 4 hydroxyl groups, 1 to 2  $C_1$ - $C_4$  alkoxy groups, 1 to 2 carboxy groups,

or a straight-chain, branched, saturated or unsaturated C<sub>2</sub>-C<sub>30</sub> carbon chain, which optionally contains 1 to 10 oxygen atoms, 1 to 3 -NR<sup>1</sup> groups, 1 to 2 sulfur atoms, a piperazine, a -CONR<sup>1</sup> group, an -NR<sup>1</sup>CO group, an -SO<sub>2</sub> group, an -NR<sup>1</sup>-CO<sub>2</sub> group, 1 to 2 CO groups, a group

$$-CO-N-T-N(R^1)-SO_2-R^F$$
 or 1 to 2

optionally substituted aryls and/or is interrupted by these groups and/or is optionally substituted with 1 to 3 -OR<sup>1</sup> groups, 1 to 2 oxo groups, 1 to 2 -NH-COR<sup>1</sup> groups, 1 to 2 -CONHR<sup>1</sup> groups, 1 to 2 (-CH<sub>2</sub>)<sub>p</sub>-CO<sub>2</sub>H groups, 1 to 2 groups -(CH<sub>2</sub>)<sub>p</sub>-(O)<sub>q</sub>-CH<sub>2</sub>CH<sub>2</sub>-R<sup>F</sup>,

whereby

R1, and p and q have the above-indicated meanings,

represents a straight-chain or branched perfluoroalkyl radical with 4 to 30 carbon atoms, and A is a molecule portion that contains 1-6 metal complexes, and Z<sup>1</sup>, independently of one another, mean a hydrogen atom or a metal ion equivalent of atomic numbers 21-29, 39, 42, 44 or 57-83.

18. (Withdrawn) A formulation according to claim 5, wherein metal complex M is a complex of general formula XIII

$$CO_2Z^1$$
 $CO_2Z^1$ 
 $CO_2Z^1$ 

in which  $Z^1$ , independently of one another, mean a hydrogen atom or a metal ion equivalent of atomic numbers 21-29, 39, 42, 44 or 57-83.

19. (Withdrawn) A formulation according to claim 4, wherein molecule portion A has the following structure:

whereby

- $q^1$  is a number 0, 1, 2 or 3,
- K stands for a complexing agent or metal complex or salts thereof of organic and/or inorganic bases or amino acids or amino acid amides,
- X is a direct bond for the perfluoroalkyl group, a phenylene group or a C<sub>1</sub>-C<sub>10</sub> alkyl chain, which optionally contains 1-15 oxygen atoms, 1-5 sulfur atoms, 1-10 carbonyl

groups, 1-10 (NR) groups, 1-2 NRSO<sub>2</sub> groups, 1-10 CONR groups, 1 piperidine group, 1-3 SO<sub>2</sub> groups, 1-2 phenylene groups or optionally is substituted by 1-3 radicals R<sup>F</sup>, in which R stands for a hydrogen atom, a phenyl, benzyl or a C<sub>1</sub>-C<sub>15</sub> alkyl group, which optionally contains 1-2 NHCO groups, 1-2 CO groups, 15 oxygen atoms and optionally is substituted by 1-5 hydroxy, 1-5,methoxy, 1-3 carboxy, 1-3 R<sup>F</sup> radicals,

Y is a direct bond or a chain of general formula II<sup>1</sup> or III<sup>1</sup>

$$\beta - N - (CH_2)_k - (Z^1)_1 - (CH_2)_m - C - \alpha$$

$$R^{1a}$$
(II<sup>1</sup>)

in which

- R<sup>la</sup> is a hydrogen atom, a phenyl group, a benzyl group or a C<sub>1</sub>-C<sub>7</sub> alkyl group, which optionally is substituted with a carboxy group, a methoxy group or a hydroxy group,
- Z<sup>1</sup> is a direct bond, a polyglycol ether group with up to 5 glycol units or a molecule portion of general formula IV<sup>1</sup>

$$-CH(R^{2a})- (IV^1)$$

in which R<sup>2a</sup> is a C<sub>1</sub>-C<sub>7</sub> carboxylic acid, a phenyl group,

a benzyl group or a -(CH2)1\_5-NH-K group,

- $\alpha$  represents the binding to the nitrogen atom of the skeleton chain,  $\beta$  represents the binding to the complexing agent or metal complex K,
- and in which variables k and m stand for natural numbers between 0 and 10, and 1 stands for 0 or 1,

and whereby

• G is a CO or SO<sub>2</sub> group.

20. (Withdrawn) A formulation according to claim 5, in which linker L stands for a molecule portion according to general formula XIV

in which

N represents a nitrogen atom,

Al means a hydrogen atom, a straight-chain or branched C<sub>1</sub>-C<sub>30</sub> alkyl group, which optionally is interrupted by 1-15 oxygen atoms and/or optionally is substituted with 1-10 hydroxy groups, 1-2 COOH groups, a phenyl group, a benzyl group and/or 15 -OR<sup>4</sup> groups, with R<sup>4</sup> in the meaning of a hydrogen atom or a CI-C7 alkyl radical, or B1-R<sup>1</sup>,

means a straight-chain or branched C<sub>1</sub>-C<sub>30</sub> alkylene group that optionally is interrupted by 1-10 oxygen atoms, 1-5 -NH-CO groups, 1-5 -CO-NH groups, by a phenylene group (that is optionally substituted by a COOH group), 1-3 sulfur atoms, 1-2 -N(B2)-SO<sub>2</sub> groups, and/or 1-2 -SO<sub>2</sub>-N(B2) groups with B2 in the meaning of Al, an NHCO group, a CONH group, an N(B2)-SO<sub>2</sub> group, or an -SO<sub>2</sub>-N(B2) group and/or optionally is substituted with radical R<sup>F</sup> a straight or branched perfluoroalkyl radical with 4 to 30 carbon atoms,

and in which a represents the binding to metal complex M, and b

represents the binding to a straight or branched perfluoroalkyl radical with 4 to 30 carbon atoms.

Reply to Office Action of November 19, 2003

21. (Withdrawn) A formulation according to claim 5, wherein metal complex M stands for a metal complex of general formula XV

$$\begin{array}{c|c} COOR^1 \\ \hline N & R^2 & R^3 \\ \hline N & N & U \\ \hline \\ COOR^1 & (XV) \\ \end{array}$$

whereby

 $R^1$ 

stands for a hydrogen atom or a metal ion equivalent of atomic numbers 21-29, 31, 32, 37-39, 42-44, 49 or 57-83,

 $R^2$  and  $R^3$ 

stand for a hydrogen atom, a CI-C7 alkyl group, a benzyl group, a

phenyl group, - $CH_2OH$  or - $CH_2$ - $OCH_3$ ,

U

stands for radical L, in which radical L stands for a molecule portion according to general formula XIV

in which

N

represents a nitrogen atom,

A1

means a hydrogen atom, a straight-chain or branched  $C_1$ - $C_{30}$  alkyl group, which optionally is interrupted by 1-15 oxygen atoms and/or optionally is substituted with 1-10 hydroxy groups, 1-2 COOH groups, a phenyl group, a benzyl group and/or 1-5 -OR<sup>1</sup> groups, with  $R^4$  in the meaning of a hydrogen atom or a  $C_1$ - $C_7$  alkyl radical, or B1- $R^F$ 

Reply to Office Action of November 19, 2003

Page 23

В1

means a straight-chain or branched C<sub>1</sub>-C<sub>30</sub> alkylene group that optionally is interrupted by 1-10 oxygen atoms, 1-5 -NH-CO groups, 1-5 -CO-NH groups, by a phenylene group (that is optionally substituted by a COOH group), 1-3 sulfur atoms, 1-2 -N(B2)-SO<sub>2</sub> groups, and/or 1-2 -SO<sub>2</sub>-N(B2) groups with B2 in the meaning of Al, an NHCO group, a CONH group, an N(B2)-SO<sub>2</sub> group, or an -SO<sub>2</sub>N(B2) group and/or optionally is substituted with radical R<sup>F</sup> a straight or branched perfluoroalkyl radical with 4 to 30 carbon atoms,

and in which a represents the binding to metal complex M, and b

represents the binding to a straight or branched perfluoroalkyl radical

with 4 to 30 carbon atoms.

whereby L and U, independently of one another, can be the same or different, however.

- 22. (Withdrawn) A formulation according to claim 1, wherein the central atom of the metal complex is a gadolinium atom (atomic number 64).
- 23. (Previously presented) A formulation according to claim 1, wherein the diamagnetic, perfluoroalkyl-containing substances are those of general formula XVI:

$$R^{F}-L^{1}-B^{2}$$
 (XVI)

in which R<sup>F</sup> represents a straight-chain or branched perfluoroalkyl radical with 4 to 30 carbon atoms, L stands for a linker, and B<sup>2</sup> stands for a hydrophilic group.

- **24.** (**Previously presented**) A formulation according to claim 23, wherein linker L<sup>1</sup> is a direct bond, an -SO<sub>2</sub> group or a straight-chain or branched carbon chain with up to 20 carbon atoms, which can be substituted with one or more -OH, -COO, -SO<sub>3</sub> groups and/or optionally contains one or more -O-, -S-, -CO-, -CONH-, -NHCO-, -CONR-, -NRCO-, -SO<sub>2</sub>-, -PO<sub>4</sub>-, -NH, NR groups, an aryl ring or a piperazine, whereby R stands for a C<sub>1</sub> to C<sub>20</sub> alkyl radical, which in turn can contain one or more 0 atoms and/or can be substituted with -COO or SO<sub>3</sub> groups.
- 25. (Previously presented) A formulation according to claim 23, wherein the hydrophilic group is a monosaccharide or a disaccharide, one or more adjacent -COO or -SO<sub>3</sub> groups, a dicarboxylic acid, an isophthalic acid, a picolinic acid, a benzenesulfonic acid, a tetrahydropyrandicarboxylic acid, a 2,6-pyridinecarboxylic acid, a quaternary ammonium ion, an aminopolycarboxylic acid, an aminodipolyethyleneglycosulfonic acid, an aminopolyethylene glycol group, an SO<sub>2</sub>-(CH<sub>2</sub>)<sub>2</sub>-OH group, a polyhydroxyalkyl chain with at least two hydroxyl groups or one or more polyethylene glycol chains with at least two glycol units, whereby the polyethylene glycol chains are terminated by an -OH or -OCH<sub>3</sub> group.
- 26. (Withdrawn) A formulation according to claim 1, wherein the diamagnetic perfluoroalkyl containing substances are conjugates that consist of  $\alpha$ -,  $\beta$ -, or  $\gamma$ -cyclodextrin and compounds of general formula XVIII:

$$A^{1}-L^{3}-R^{F} (XVIII)$$

in which A<sup>1</sup> stands for an adamantane, biphenyl or anthracene molecule, L<sup>3</sup> stands for a linker and R<sup>F</sup> stands for a straight-chain or branched perfluoroalkyl radical with 4 to 30

Reply to Office Action of November 19, 2003

Page 25

carbon atoms; and whereby linker  $L^3$  is a straight-chain hydrocarbon chain with 1 to 20 carbon atoms, which can be interrupted by one or more oxygen atoms, one or more CO-, SO<sub>2</sub>-, CONH-, NHCO-, CONR-, NRCO-, NH-, NR groups or a piperazine, whereby R is a  $C_1$ - $C_5$  alkyl radical.

- 27. (Withdrawn) A formulation according to claim 1, wherein the perfluoroalkyl chains of the perfluoroalkyl-containing metal complex and the other perfluoroalkyl-containing compounds contain 6 to 12 carbon atoms.
- 28. (Withdrawn) A formulation according to claim 1, wherein the perfluoroalkyl chains contain 8 carbon atoms in each case.
- 29. (Withdrawn) A formulation according to claim 1, wherein it has a metal concentration of 50 to 250 mmol/ 1.
- 30. (Withdrawn) A substance of general formula XVII

 $R^{F}-X^{I}$  (XVII)

in which  $R^F$  represents a straight-chain or branched perfluoroalkyl radical with 4 to 30 carbon atoms, and  $X^I$  is a radical that is selected from the group of the following radicals (in this case, n is a number between 1 and 10):

31. (Withdrawn) A conjugate that consist of  $\alpha$ -,  $\beta$ -, or  $\gamma$ -cyclodextrin and compounds of general formula XVIII

$$A^1-L^3-R^F$$
 (XVIII)

in which  $A^1$  stands for an adamantane, biphenyl or anthracene molecule,  $L^3$  stands for a linker and  $R^1$  stands for a straight-chain or branched perfluoroalkyl radical with 4 to 30 carbon atoms, and whereby linker  $L^3$  is a straight-chain hydrocarbon chain with 1 to 20 carbon atoms, which can be interrupted by one or more oxygen atoms, one or more CO-,  $SO_2$ -, CONH-, NHCO-, CONR-, NRCO-, NH-, NR groups or a piperazine, whereby R is a  $C_1$ - $C_5$  alkyl radical.

- 32. (Withdrawn) A process for the production of galenical formulations according to claim 1, wherein the paramagnetic and diamagnetic perfluoroalkyl-containing compounds are dissolved in a solvent while being stirred vigorously.
- 33. (Withdrawn) A process for the production of galenical formulations according to claim 1, wherein the paramagnetic and diamagnetic perfluoroalkyl-containing compounds are dissolved in a solvent while being treated simultaneously with ultrasound.
- 34. (Withdrawn) A process for the production of galenical formulations according to claim 1, wherein the paramagnetic and diamagnetic perfluoroalkyl-containing compounds are dissolved in a solvent while being treated simultaneously with microwaves.

35. (Withdrawn) A process for the production of galenical formulations according to claim 1, wherein the paramagnetic and diamagnetic perfluoroalkyl-containing compounds are dissolved in two different solvents, both solutions are added together, and one of the two solvents is distilled off.

- 36. (Withdrawn) A solid formulation according to claim 1, wherein it is produced by freezedrying a solution, which contains paramagnetic and diamagnetic perfluoroalkyl-containing substances.
- 37. (Withdrawn) Contrast media for nuclear spin tomography comprising galenical formulations according to claim 1.
- 38. (Withdrawn) Contrast media for visualizing lymph nodes or a blood-pool comprising galenical formulations according to claim 1.
- 39. (Previously amended) A formulation according to claim 2, wherein the ratio of the paramagnetic perfluoroalkyl compound to the diamagnetic perfluoroalkyl compound is from 40:60 to 60:40.
- **40.** (Previously Presented) A formulation according to claim 2, wherein the diamagnetic perfluoroalkyl-compound is from 5-40%.

Reply to Office Action of November 19, 2003

Page 28

41. (Withdrawn) A method of magnetic resonance imaging comprising administering to a patient a contrast agent which is a galenical formulation of claim 1 and taking a H-based, T<sub>1</sub>-weighted magnetic resonance image of the patient.